

And this I find generally in most *Metalline* colours, that though they consist of parts so exceedingly small, yet are they very deeply ting'd, they being so ponderous, and having such a multitude of terrestrial particles throng'd into a little room; so that 'tis difficult to find any particle transparent or resembling a pretious stone, though not impossible; for I have observ'd divers such shining and resplendent colours intermixt with the particles of *Cinnaber*, both natural and artificial, before it hath been ground and broken or flaw'd into *Vermilion*: As I have also in *Orpiment*, *Red-lead*, and *Bise*, which makes me suppose, that those *metalline* colours are by grinding, not onely broken and separated actually into smaller pieces, but that they are also flaw'd and brused, whence they, for the most part, become *opacous*, like flaw'd Crystal or Glass, &c. But for *Smalts* and *verditures*, I have been able with a *Microscope* to perceive their particles very many of them transparent.

Now, that the others also may be transparent, though they do not appear so to the *Microscope*, may be made probable by this Experiment: that if you take *ammel* that is almost *opacous*, and grind it very well on a *Porphyry*, or *Serpentine*, the small particles will by reason of their flaws, appear perfectly *opacous*; and that 'tis the flaws that produce this *opacousness*, may be argued from this, that particles of the same *Ammel* much thicker if unflaw'd will appear somewhat transparent even to the eye; and from this also, that the most transparent and clear Crystal, if heated in the fire, and then suddenly quenched, so that it be all over flaw'd, will appear *opacous* and white.

And that the particles of *Metalline* colours are transparent, may be argued yet further from this, that the Crystals, or *Vitriols* of all Metals, are transparent, which since they consist of *metalline* as well as *saline* particles, those *metalline* ones must be transparent, which is yet further confirm'd from this, that they have for the most part, appropriate colours; so the *vitriol* of Gold is Yellow; of Copper, Blue, and sometimes Green; of Iron, green; of Tinn and Lead, a pale White; of Silver, a pale Blue, &c.

And next, the *Solution* of all Metals into *menstruums* are much the same with the *Vitriols*, or Crystals. It seems therefore very probable, that those colours which are made by the precipitation of those particles out of the *menstruums* by transparent precipitating liquors should be transparent also. Thus Gold precipitates with oyl of Tartar, or spirit of Urine into a brown Yellow. Copper with spirit of Urine into a Mucous blue, which retains its transparency. A solution of sublimate (as the same illustrious Authour I lately mention'd shews in his 40. Experiment) precipitates with oyl of Tartar per deliquium, into an Orange colour'd precipitate; nor is it less probable, that the calcination of those *Vitriols* by the fire, should have their particles transparent: Thus *Saccarum Saturni*, or the *Vitriol of Lead* by calcination becomes a deep Orange-colour'd *minium*, which is a kind of precipitation by some Salt which proceeds from the fire; common *Vitriol calcin'd*, yields a deep Brown Red, &c.

A third Argument, that the particles of Metals are transparent, is, that being calcin'd, and melted with Glass, they tinge the Glass with transpa-

rent colours. Thus the *Calx* of Silver tinges the glass with a lovely Yellow, or Gold colour, &c.

And that the parts of Metals are transparent, may be argued from the transparency of Leaf-gold, which held to the naked eye, and the *Microscope*, exhibits though I have never seen the other Metals *laminated* able to perceive them transparent, yet, for Copper the same conveniency for *laminating* them, as we have perhaps, through such plates or leaves, find very different colours; for it seems very probable, that those Rays which they ting'd, with a deep Yellow, or pale Red, as a pale Yellow, as from Brass, have pass'd through them, and receive how by reflection alone those Rays can receive any *Hypothesis* extant.

So that we see there may a sufficient reason be found in these instances, why those colours which we are unable to see, Yellow, or Blue, or Green, are not therefore to be ascribed a deeper degree of them; for supposing we had a great number of Globular essence Bottles, or round Glass bubbles, about an inch in diameter, fill'd each of them with a very deep mixture of any one of them did appear of a deep Scarlet colour, together did exhibit at a distance, a deep dy'd Scarlet colour, follow, because after we have come nearer to this colour, and divided it into its parts, and examining each of its parts, we find them to have much the same colour with the whole, not, I say, therefore follow, that if we could break them into any other ways come to see a smaller or thinner liquor that fill'd those bubbles, that that ting'd liquor would appear Red, or of a Scarlet hue, since if Experiment be made, it will ensue; for it is capable of being diluted into the same colour.

Now, that I might avoid all the Objections of this Experiment that might by ocular proof convince, I provided me a Prism hollow, just in the form of a Wedge, such as is represented in the Figure of the sixth Scheme. The two parallelogram sides, which met at a point, were made of the clearest Loden ground and polish'd that I could get; these were joined to the triangular sides, B C E, A D F, which were of glass, and the whole Prismatical Box was exact, but only a little hole near the base was left, where it was fill'd with any liquor, or emptied again at pleasure.

One of these Boxes (for I had two of them) I fill'd with a tincture of *Aloes*, drawn onely with fair Water, and with a piece of Wax, then, by holding this Wedge against the eye, looking through it, it was obvious enough to see the rays of light near the edge of the Wedge where it was but very